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# FOURTH QUARTER 2005 MONITORING REPORT AND RECOMMENDATION FOR NO FURTHER ACTION

**Tesoro Site #67058; LOP No: 14-694**
**921 West Hamilton Avenue**
**Campbell, California**

January 31, 2006
AZ142-020

*Prepared for:*
Tesoro Environmental Resources Company
3450 S. 344th Way #201
Auburn, WA 98001

AZURE ENVIRONMENTAL

TESORO

Tesoro Petroleum Companies, Inc.
3450 South 344th Way, Suite 201
Auburn, WA 98001-5931
253 896 8700
253 896 8887 Fax

January 31, 2006

Mamerto Jorvina
Santa Clara County – Dept. of Env. Health
1555 Berger Drive, Suite 300
San Jose, California 95112-2716

**RE: Fourth Quarter 2005 Ground-Water Monitoring Report**
**Tesoro Site #67058; No: 14-694**
**921 West Hamilton Avenue, Campbell, California**

Dear Mr. Jorvina:

Enclosed please find a copy of the quarterly monitoring report for the subject site located at 921 West Hamilton Avenue, Campbell, California. This report is submitted by Azure Environmental on behalf of Tesoro Environmental Resources Company.

Based on my inquiry of the person or persons directly responsible for gathering the information contained in this report, I believe the information was prepared by qualified personnel who properly gathered and evaluated the information, and that the information submitted is, to the best of my knowledge and belief, true, correct, and complete.

Please feel free to call me at 253/896-8700 or Jeff Hennier of Azure Environmental at 415/460-1561 if you have any questions.

Sincerely,

Jeffrey M. Baker, P.E.
Tesoro Environmental Resources Company

cc: Chuck Miller, USA Petroleum
Brian Kelleher, Kelleher & Associates
File No. 67058

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## SIGNATURE PAGE

All hydrogeologic and geologic information, conclusions, and recommendations contained in this report have been prepared by a California Certified Hydrogeologist.


Jeff Hennier
Principal Hydrogeologist
California Professional Geologist (4605)
California Certified Hydrogeologist (105)

Date: January 31, 2006

January 31, 2006

AZURE ENVIRONMENTAL
AZ142-020

**FOURTH QUARTER 2005 MONITORING REPORT AND RECOMMENDATION FOR NO FURTHER ACTION**
**Tesoro Site #67058; No: 14-694**
**921 West Hamilton Avenue**
**Campbell, California**

## 1.0 INTRODUCTION

This Fourth Quarter 2005 Ground-Water Monitoring Report was prepared on behalf of Tesoro Environmental Resources Company (Tesoro) for the Tesoro Site #67058 (former Beacon Station #3786) at 921 West Hamilton Avenue in Campbell, California ("the Site"; Figure 1). Ground-water monitoring was performed at the Site pursuant to the request of the Santa Clara County Department of Environmental Health (SCCDEH) in their letter to Tesoro and Green Valley Gasoline dated February 1, 2005. This report presents the results of ground-water monitoring performed at the Site for the period of October 1 through December 31, 2005.

Based on results of historical and the most recent four successive quarters of ground-water monitoring completed during 2005, a rationale for recommending no further actions at the Site is presented in this report. Completion of a full hydrological cycle of monitoring at well MW-1 was completed during 2005 in accordance with the request from the SCCDEH in their February 1, 2005 letter.

## 2.0 GROUND-WATER MONITORING RESULTS

Ground-water monitoring performed at the Site consisted of the following activities:

- Collection of ground-water level measurements from monitoring well MW-1.
- Collection and laboratory analysis of ground-water samples from Site monitoring wells.

### 2.1 Ground-Water Elevations and Flow Direction

Water-level measurements and calculated ground-water elevations were collected from monitoring wells MW-1 through MW-4 on November 16, 2005. Monitoring well construction data are summarized in Table 1; water-level measurement and calculated ground-water elevation data are summarized in Table 2. Ground-water elevations from Site monitoring wells were used to construct a water table elevation contour map (Figure 2).

Ground-water level data indicate the depth to ground water measured in the monitoring wells on November 16, 2005 varied between 49.00- and 50.17-feet below grade. These data indicate slightly lower ground-water levels at the Site compared to previous water-level measurements collected in August 2005 (approximately 0.63-feet lower at well MW-1). Water-table elevation data collected at the Site indicate the general direction of ground-water flow is toward the east-northeast (Figure 2). Shallow ground water in the site vicinity flows toward the east-northeast

under a calculated horizontal hydraulic gradient of approximately 0.011 ft/ft. These data are generally consistent with potentiometric data and interpretations of ground-water flow direction at the Site presented in previous investigation and monitoring reports (Figure 2).

## 2.2 Ground-Water Sampling and Laboratory Analysis

Ground-water samples were collected from monitoring well MW-1 on November 16, 2005. Monitoring well MW-1 is located adjacent to fuel USTs at the Site (Figure 2). Ground-water samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and fuel oxygenates, including methyl tertiary-butyl ether (MTBE). Laboratory analysis results are summarized in Table 3; laboratory certificates are included in Appendix A and field sampling data sheets are included in Appendix B. Most recent ground-water monitoring data are illustrated in Figure 3.

Fourth quarter 2005 ground-water monitoring data indicate low to trace concentrations of petroleum hydrocarbons continue to be detected at well MW-1 (Table 3; Figure 3). MTBE and other fuel oxygenates were not detected and have never been detected at monitoring wells MW-1 through MW-4 (Table 3). Relatively low TPHg (520 ug/l) and trace benzene (1.2 ug/l) concentrations were detected at well MW-1. The fourth quarter 2005 sampling results for well MW-1 revealed slightly higher concentrations compared to the previous quarter sampling results collected in August 2005 (240 ug/l TPHg and 0.61 ug/l benzene, respectively). Sampling results for TPHg and benzene collected during 2004 and 2005 indicate relatively low and decreasing concentrations at well MW-1 (Figure 4). Previous monitoring data indicate petroleum hydrocarbons were not detected at downgradient wells MW-2 through MW-4 (Table 3).

## 2.3 Natural Attenuation Parameter Data

Table 4 summarizes additional parameters collected from wells MW-1, MW-2 and MW-3 to assess natural attenuation processes in Site ground water. Natural attenuation parameters collected include dissolved inorganic analytes (including electron acceptors) and dissolved oxygen (DO) measurements. Common electron acceptors and metabolic products in biodegradation processes include methane and dissolved inorganic analytes ferrous iron, nitrate and sulfate. Laboratory analysis of natural attenuation parameters was conducted for the second quarter 2004 sampling event; DO measurements were collected for subsequent sampling events (Table 4). Wells MW-1, MW-2 and MW-3 were selected for natural attenuation parameter analysis because the wells are generally aligned in the downgradient ground-water flow path across the Site (Figure 2).

Anaerobic biodegradation of petroleum hydrocarbons in the area of well MW-1 in the second quarter 2004 is indicated by natural attenuation parameter data of lower nitrate concentrations, higher methane concentrations and low DO concentrations at well MW-1 compared to data from downgradient wells MW-2 and MW-3 (Table 4). These data appear indicative of petroleum hydrocarbon biodegradation through denitrification and methanogenesis processes, respectively. Subsequent monitoring data at well MW-1 show increasing DO concentrations during the period

from July 2004 (1.0 ppm) to November 2005 (4.5 ppm), indicating aerobic degradation processes appear to be active in the vicinity of well MW-1. Petroleum hydrocarbon concentrations in ground water are expected to continue to decrease as a result of biodegradation and other natural attenuation processes (i.e., dispersion, dilution, adsorption, and volatilization). These degradation processes should ultimately reduce the concentrations and mass of petroleum hydrocarbons in Site ground water to meet remedial goals.

## 3.0 RECOMMENDATION FOR NO FURTHER ACTION

Ground-water investigation and monitoring results indicate fuel oxygenates, including MTBE, were not detected (Table 3). Previous soil investigation results conducted in May 2003 indicate petroleum hydrocarbons and fuel oxygenates were not detected in soil samples collected at depths between near surface (i.e., 5 feet) and the ground-water table (i.e., 50 feet) from well borings MW-1 through MW-4 (Azure, 2003b). Based on these data, there is no indication of the occurrence of an MTBE release to soil and ground water at the Site.

Quarterly monitoring data collected during a full hydrological cycle during 2005 indicate TPHg and benzene were detected at relatively low concentrations at Site monitoring well MW-1. These and previous data indicate the extent of TPHg and benzene in Site ground water appears to be limited to the area within approximately 50 feet of well MW-1 and the USTs (Figure 3). Four successive quarters of monitoring data indicate petroleum hydrocarbon concentrations at well MW-1 are generally decreasing and the petroleum hydrocarbon plume appears stable. Natural attenuation parameter monitoring data indicate biodegradation processes appear to be actively reducing petroleum hydrocarbon concentrations in Site ground water and petroleum hydrocarbon concentrations are expected to continue to decrease as a result of biodegradation and other natural attenuation processes. These degradation processes should ultimately reduce the concentrations and mass of petroleum hydrocarbons in Site ground water to meet remedial goals.

Site historical information indicates soil vapor and ground-water extraction and treatment systems were operated at the Site between 1993 and 1996 and the SCVWD granted UST case closure in January 1997 (EA, 1997). The highest benzene concentration detected at well MW-1 during 2005 (4.1 ug/l March 2005) is lower than the highest benzene concentration (30 ug/l) detected in ground-water samples collected in July 1996, prior to case closure in January 1997 (SCVWD, 1997; EA, 1997).

No further actions are recommended based on ground-water investigation and monitoring data indicating only trace benzene concentrations and decreasing concentrations of TPHg and benzene in a limited area of the Site near well MW-1 during the most recent four consecutive quarters of ground-water monitoring. Following SCCDEH approval of case closure, decommission of the Site monitoring wells is recommended in accordance with regulatory guidelines.

## 4.0 SELECTED REFERENCES


Alton Geoscience, 1996. Quarterly Progress Report, Fourth Quarter 1995, Former Exxon RAS #7-7121, 921 West Hamilton Avenue, Campbell, California. January 5.

Azure Environmental, 2003a. Workplan for Environmental Monitoring for MTBE, Tesoro Site #67058, File No. 1280.01-005 (BGS), 921 West Hamilton Avenue, Campbell, California. March 13.

Azure Environmental, 2003b. Soil and Ground-Water Investigation Report, Tesoro Site #67058, File No. 1280.01-005, 921 West Hamilton Avenue, Campbell, California. July 14.

Azure Environmental, 2004. First Quarter 2004 Monitoring Report and Additional Investigation Workplan, Tesoro Site #67058, File No. 1280.01-005, 921 West Hamilton Avenue, Campbell, California. March 3.

Azure Environmental, 2004. Second Quarter 2004 Monitoring Report and Additional Investigation Report, Tesoro Site #67058, File No. 1280.01-005, 921 West Hamilton Avenue, Campbell, California. July 30.

Azure Environmental, 2004. Third Quarter 2004 Monitoring Report and Recommendation for No Further Action, Tesoro Site #67058, File No. 1280.01-005, 921 West Hamilton Avenue, Campbell, California. October 29.

Azure Environmental, 2005. First, Second and Third Quarter 2005 Ground-Water Monitoring Reports, Tesoro Site #67058, File No. 1280.01-005, 921 West Hamilton Avenue, Campbell, California.

EA, 1997. Final Report of Quarterly Sampling and Analysis, Former Exxon Retail Site 7-7121, 921 West Hamilton Avenue, Campbell, California. March.

Santa Clara Valley Water District, 1997. Case Closure Summary, Exxon No. 7-7121, 921 West Hamilton Avenue, Campbell, California. January 9.

Santa Clara Valley Water District, 1997. Case Closure Letter, Exxon No. 7-7121, 921 West Hamilton Avenue, Campbell, California. January 28.

# TABLE 1
## SUMMARY OF MONITORING WELL CONSTRUCTION DATA
## 921 West Hamilton Avenue, Campbell, CA

| | Monitoring Well | | | |
|---|---|---|---|---|
| | MW-1 | MW-2 | MW-3 | MW-4 |
| Date of Well Completion | May-03 | May-03 | May-03 | May-03 |
| DWR No. | NA | NA | NA | 07S01W27E035 |
| SCVWD Permit No. | 03W00294 | 03W00295 | 03W00296 | 03W00297 |
| Well type | Monitoring | Monitoring | Monitoring | Monitoring |
| Currently extracting | No | No | No | No |
| Top of Casing Elevation (ft MSL) | 184.47 | 184.93 | 184.23 | 183.7 |
| Latitude | 37°17'40.00"N. | 37°17'40.54"N. | 37°17'40.34"N. | 37°17'40.18"N. |
| Longitude | 121°57'56.97"W | 121°57'56.31"W | 121°57'56.12"W | 121°57'55.99"W |
| Northing | 1933020 | 1933074 | 1933054 | 1933038 |
| Easting | 6135288 | 6135342 | 6135357 | 6135368 |
| Casing Diameter (in.) | 2 | 2 | 2 | 2 |
| Total Well Depth (ft.) | 70 | 70 | 70 | 70 |
| Bottom Casing Elev. (ft MSL) | 114.47 | 114.93 | 114.23 | 113.70 |
| Slotted Casing Depth Interval (ft) | 50 - 70 | 50 - 70 | 50 - 70 | 50 - 70 |
| Slotted Casing Elev. Interval (ft MSL) | 134.47 - 114.47 | 134.93 - 114.93 | 134.23 - 114.23 | 133.7 - 113.7 |
| Filter Pack Elev. Interval (ft MSL) | 136.47 - 114.47 | 136.93 - 114.93 | 136.23 - 114.23 | 139.7 - 113.7 |
| Bentonite Seal Elev. Interval (ft MSL) | 138.47 - 136.47 | 138.93 - 136.93 | 138.23 - 136.23 | 141.7 - 139.7 |
| Grout Elev. Interval (ft MSL) | 184.47 - 138.47 | 184.93 - 138.93 | 184.23 - 138.23 | 183.7 - 141.7 |
| Casing Type | Sched 40 PVC | Sched 40 PVC | Sched 40 PVC | Sched 40 PVC |
| Slot Type | 0.010 - inch | 0.010 - inch | 0.010 - inch | 0.010 - inch |
| Filter Pack Type | No. 3 sand | No. 3 sand | No. 3 sand | No. 3 sand |

**NOTES:** ft MSL - feet above mean sea level
Wells surveyed to arbitrary site datum by Luk and Associates, Inc. and tied to feet MSL using GPS equipment.
NA - Not Available

# TABLE 2
## SUMMARY OF GROUND-WATER ELEVATION DATA
921 West Hamilton, Campbell, CA

| Well Number | Top-of-Casing Elevation (feet MSL) | Date Measured | Depth to Water (feet) | Water Elevation (feet) | Change in Elevation (feet) |
|---|---|---|---|---|---|
| MW-1 | 184.47 | 5/23/2003 | 50.78 | 133.69 | -- |
| | | 5/27/2003 | 50.73 | 133.74 | 0.05 |
| | | 1/19/2004 | 50.92 | 133.55 | -0.19 |
| | | 5/4/2004 | 49.43 | 135.04 | 1.49 |
| | | 7/13/2004 | 50.81 | 133.66 | -1.38 |
| | | 3/14/2005 | 50.07 | 134.40 | 0.74 |
| | | 5/17/2005 | 47.85 | 136.62 | 2.22 |
| | | 8/17/2005 | 48.37 | 136.10 | -0.52 |
| | | 11/16/2005 | 49.00 | 135.47 | -0.63 |
| MW-2 | 184.93 | 5/23/2003 | 51.87 | 133.06 | -- |
| | | 5/27/2003 | 51.82 | 133.11 | 0.05 |
| | | 1/19/2004 | 52.00 | 132.93 | -0.18 |
| | | 5/4/2004 | 50.58 | 134.35 | 1.42 |
| | | 7/13/2004 | 51.93 | 133.00 | -1.35 |
| | | 3/14/2005 | 51.17 | 133.76 | 0.76 |
| | | 5/17/2005 | 49.00 | 135.93 | 2.17 |
| | | 8/17/2005 | 49.55 | 135.38 | -0.55 |
| | | 11/16/2005 | 50.17 | 134.76 | -0.62 |
| MW-3 | 184.23 | 5/23/2003 | 50.92 | 133.31 | -- |
| | | 5/27/2003 | 50.87 | 133.36 | 0.05 |
| | | 1/19/2004 | 51.24 | 132.99 | -0.37 |
| | | 5/4/2004 | 49.85 | 134.38 | 1.39 |
| | | 7/13/2004 | 51.21 | 133.02 | -1.36 |
| | | 3/14/2005 | 50.42 | 133.81 | 0.79 |
| | | 5/17/2005 | 48.25 | 135.98 | 2.17 |
| | | 8/17/2005 | 48.82 | 135.41 | -0.57 |
| | | 11/16/2005 | 49.45 | 134.78 | -0.63 |
| MW-4 | 183.70 | 5/23/2003 | 50.46 | 133.24 | -- |
| | | 5/27/2003 | 50.40 | 133.30 | 0.06 |
| | | 1/19/2004 | 50.84 | 132.86 | -0.44 |
| | | 5/4/2004 | 49.50 | 134.20 | 1.34 |
| | | 7/13/2004 | 50.88 | 132.82 | -1.38 |
| | | 3/14/2005 | 50.06 | 133.64 | 0.82 |
| | | 5/17/2005 | 47.91 | 135.79 | 2.15 |
| | | 8/17/2005 | 48.48 | 135.22 | -0.57 |
| | | 11/16/2005 | 49.10 | 134.60 | -0.62 |

**Notes:**
Wells surveyed to arbitrary site datum by Luk and Associates, Inc. and tied to feet MSL using GPS equipment.

# TABLE 3
## SUMMARY OF GROUND-WATER SAMPLE ANALYSIS RESULTS
921 West Hamilton, Campbell, CA

| Sample Location | Date Sampled | Concentration (ug/l) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE | Other Fuel Oxygenates |
| MW-1 | 5/27/2003 | 110,000 | 770 | 490 | 2,000 | 3,400 | <10 | ND |
| | 1/19/2004 | 3,400 | 3.9 | <0.5 | 8.1 | 4.2 | <1 | ND |
| | 5/4/2004 | 1,400 | 2.4 | <0.5 | 5.4 | 2.4 | <0.5 | ND |
| | 7/13/2004 | 2,300 | 4.4 | <0.5 | 14 | 5.6 | <0.5 | ND |
| | 3/21/2005 | 1,400 | 4.1 | <0.5 | 10 | 4.2 | <0.5 | ND |
| | 5/17/2005 | 1,100 | 3.5 | <0.5 | 8.3 | 2.8 | <0.5 | ND |
| | 8/17/2005 | 240 | 0.61 | <0.5 | 2 | <0.5 | <0.5 | ND |
| | 11/16/2005 | 520 | 1.2 | <0.5 | 5.4 | 0.61 | <0.5 | ND |
| MW-2 | 5/27/2003 | 480 | 4.2 | 11 | 3.7 | 6 | <1 | ND |
| | 1/19/2004 | <50 | <0.5 | <0.5 | <0.5 | <1.5 | <1 | ND |
| | 5/4/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| | 7/13/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| MW-3 | 5/27/2003 | <50 | <0.5 | <0.5 | <0.5 | <1.5 | <1 | ND |
| | 1/19/2004 | <50 | <0.5 | <0.5 | <0.5 | <1.5 | <1 | ND |
| | 5/4/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| | 7/13/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| MW-4 | 5/27/2003 | <50 | <0.5 | <0.5 | <0.5 | <1.5 | <1 | ND |
| | 1/19/2004 | <50 | <0.5 | <0.5 | <0.5 | <1.5 | <1 | ND |
| | 5/4/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| | 7/13/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| HP-1 | 5/4/2004 | <50 | 0.69 | <0.5 | <0.5 | <0.5 | <0.5 | ND |
| HP-2 | 5/4/2004 | <50 | 0.95 | 0.51 | <0.5 | <0.5 | <0.5 | ND |
| HP-3 | 5/4/2004 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND |

**Notes:**

TPHg = Total Petroleum Hydrocarbons as Gasoline
Other Fuel Oxygenates = TBA, DIPE, ETBE, TAME
ND = Not detected

# TABLE 4
## NATURAL ATTENUATION PARAMETER SAMPLING RESULTS
921 West Hamilton, Campbell, CA

| Well Number | Date Sampled | Concentration (mg/l) | | | | |
|---|---|---|---|---|---|---|
| | | Ferrous Iron | Methane | Nitrate | Sulfate | Dissolved Oxygen |
| MW-1 | 5/4/2004 | <0.1 | 0.00481 | 3.8 | 53 | 2.0 |
| | 7/13/2004 | NM | NM | NM | NM | 1.0 |
| | 3/21/2005 | NM | NM | NM | NM | 2.9 |
| | 5/17/2005 | NM | NM | NM | NM | 3.7 |
| | 8/17/2005 | NM | NM | NM | NM | 4.0 |
| | 11/16/2005 | NM | NM | NM | NM | 4.5 |
| MW-2 | 5/4/2004 | <0.1 | 0.00153 | 4.1 | 54 | 3.5 |
| | 7/13/2004 | NM | NM | NM | NM | 2.6 |
| MW-3 | 5/4/2004 | <0.1 | <0.001 | 4.5 | 53 | 3.3 |
| | 7/13/2004 | NM | NM | NM | NM | 4.1 |
| MW-4 | 5/4/2004 | NM | NM | NM | NM | 3.6 |
| | 7/13/2004 | NM | NM | NM | NM | 3.6 |

**Notes:**

Samples analyzed for inorganic compounds by analytical laboratory methods.
Dissolved oxygen concentrations collected by field measurement.

NM = Not measured

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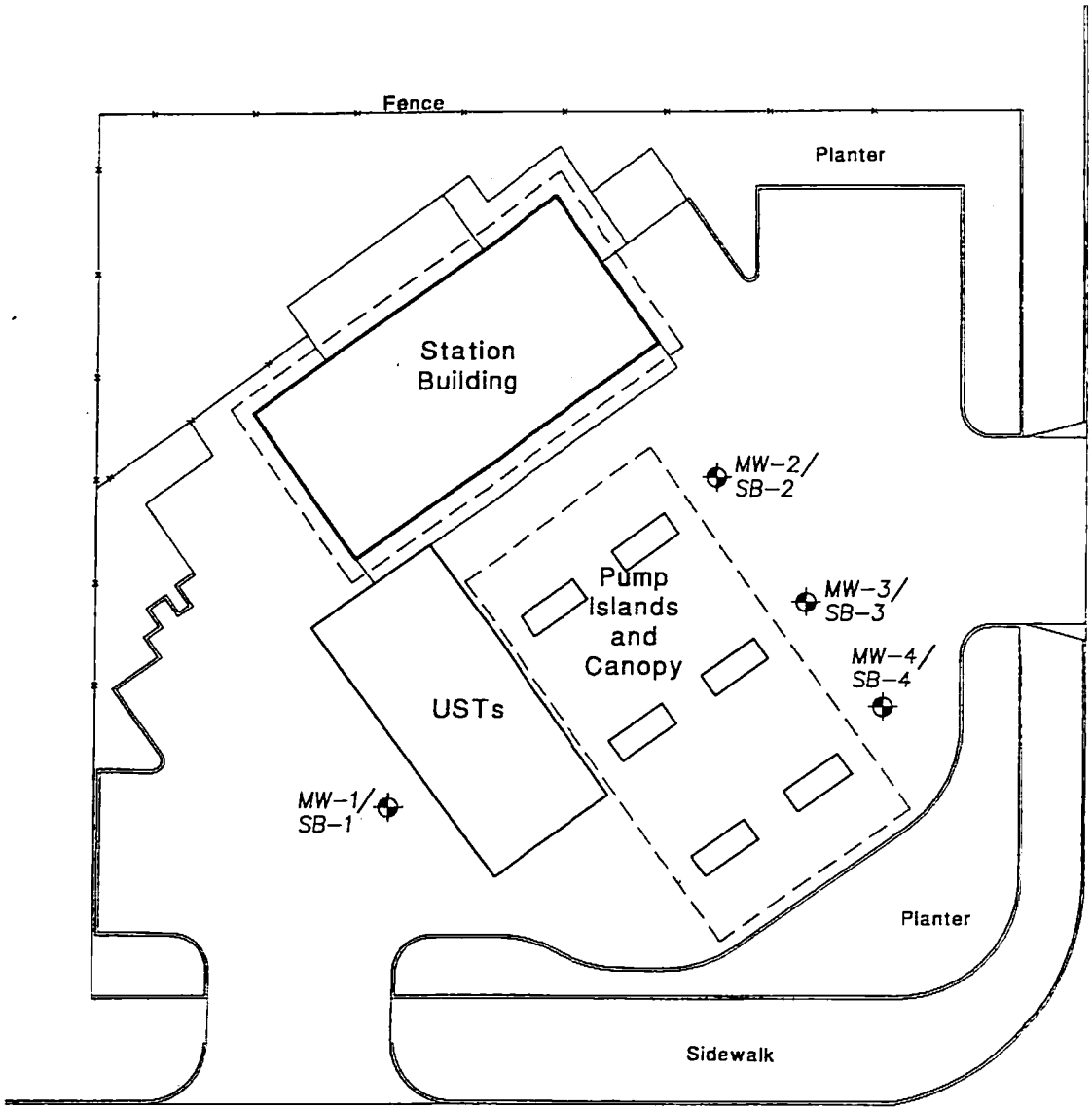


MAP SOURCE:
O.K.O. ENGINEERING INC., 3/17/98

EXPLANATION

⊕ Soil boring and monitoring well location

NORTH

0 30'

Figure 1: Site Map

AZURE ENVIRONMENTAL AZ142-020

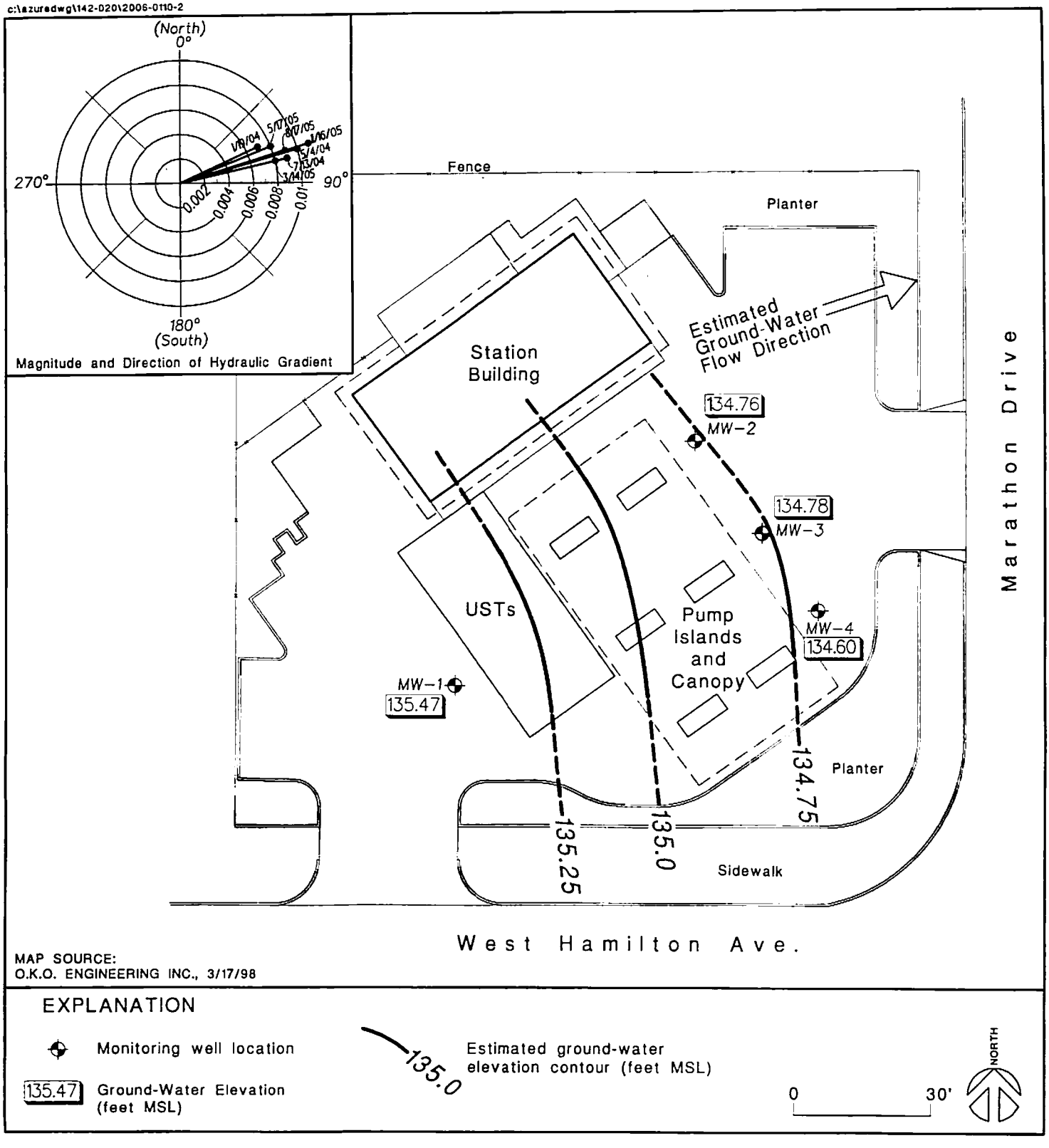


Figure 2: Ground-Water Elevations Measured on November 16, 2005

AZURE ENVIRONMENTAL AZ142-020

c:\azuredwg\142-020\2006-0110-3

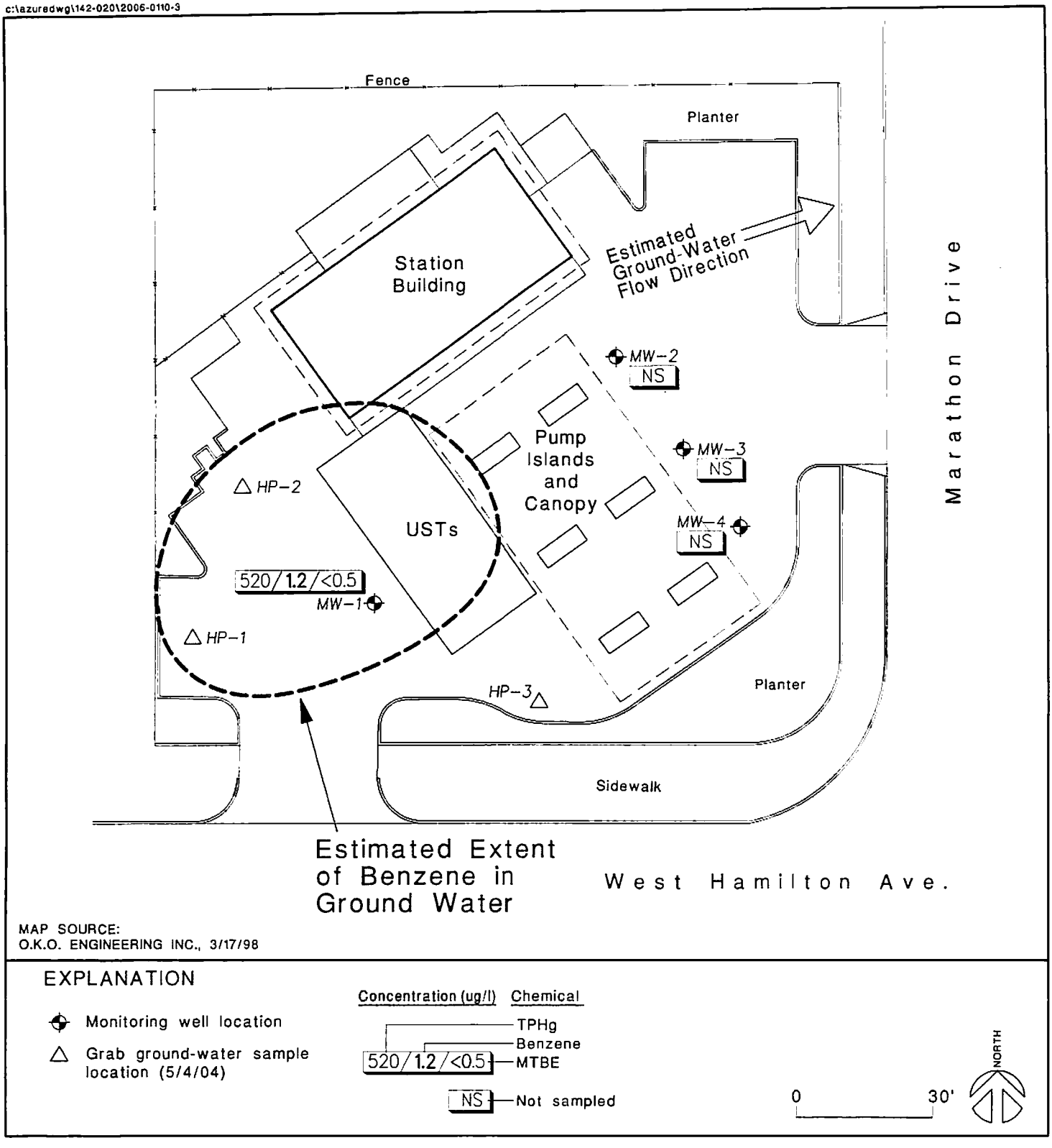


Figure 3: Ground-Water Sampling Results - Fourth Quarter, 2005

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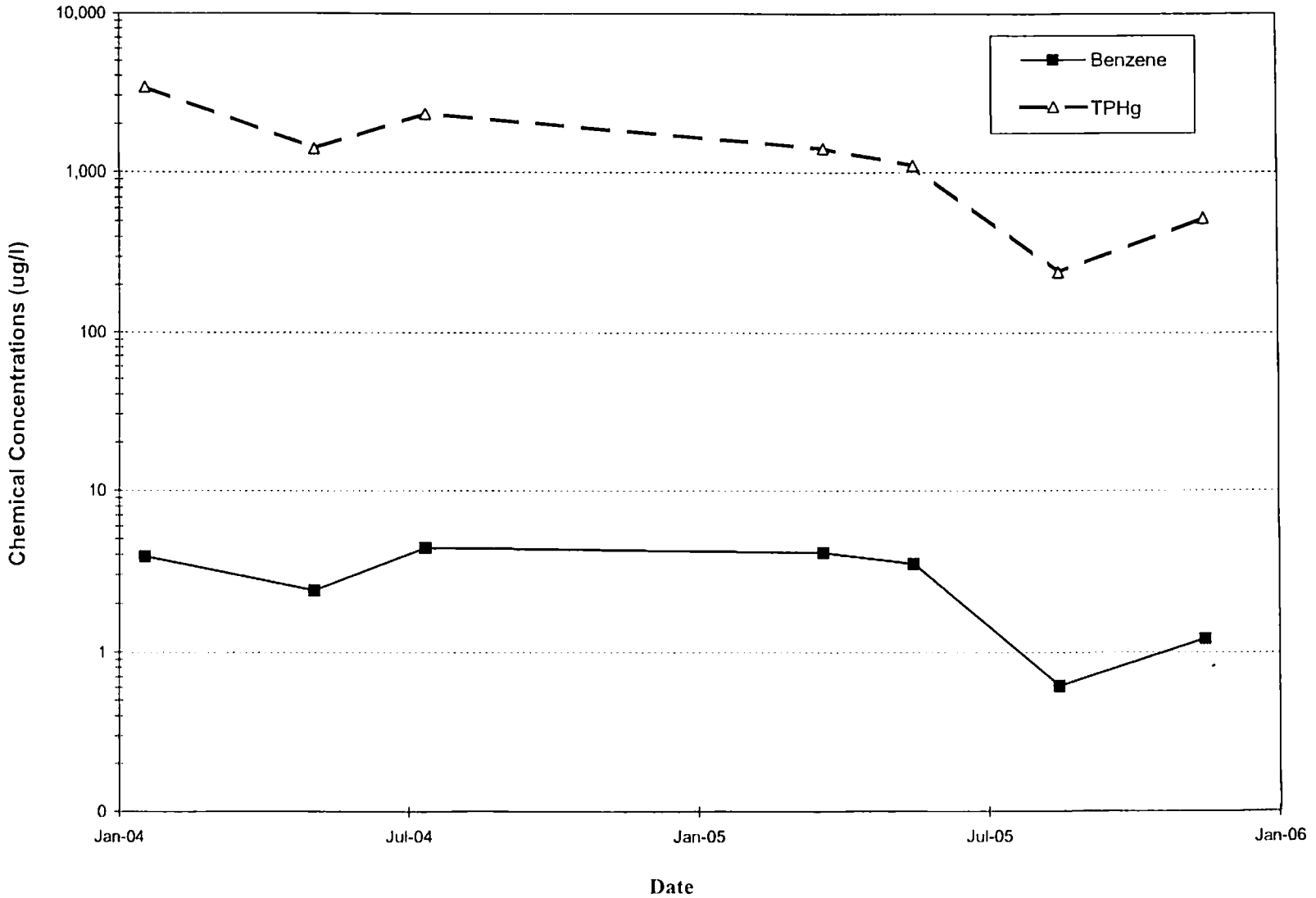
**FIGURE 4**
**BENZENE AND TPHg CONCENTRATIONS IN WELL MW-1**
**2004 and 2005 Monitoring Data**
921 West Hamilton, Campbell, CA



# APPENDIX A

# LABORATORY CERTIFICATES

KIFF Analytical LLC

Report Number : 47047
Date : 11/29/2005

Jeff Hennier
Azure Environmental
85 Bolinas Road, Suite 5
Fairfax, CA 94930

Subject : 1 Water Sample
Project Name : Tesoro Campbell
Project Number : AZ142-020

Dear Mr. Hennier,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 47047
Date : 11/29/2005

Project Name : **Tesoro Campbell**
Project Number : **AZ142-020**

Sample : **MW-1** Matrix : Water Lab Number : 47047-01
Sample Date :11/16/2005

| Parameter | Measured Value | Method Reporting Limit | Units | Analysis Method | Date Analyzed |
|---|---|---|---|---|---|
| **Benzene** | **1.2** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Toluene** | **< 0.50** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Ethylbenzene** | **5.4** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Total Xylenes** | **0.61** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Methyl-t-butyl ether (MTBE)** | **< 0.50** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Diisopropyl ether (DIPE)** | **< 0.50** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Ethyl-t-butyl ether (ETBE)** | **< 0.50** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Tert-amyl methyl ether (TAME)** | **< 0.50** | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| **Tert-Butanol** | **< 5.0** | 5.0 | ug/L | EPA 8260B | 11/22/2005 |
| **TPH as Gasoline** | **520** | 50 | ug/L | EPA 8260B | 11/22/2005 |
| Toluene - d8 (Surr) | 105 | | % Recovery | EPA 8260B | 11/22/2005 |
| 4-Bromofluorobenzene (Surr) | 98.7 | | % Recovery | EPA 8260B | 11/22/2005 |

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 47047

Date : 11/29/2005

**QC Report : Method Blank Data**

Project Name : **Tesoro Campbell**

Project Number : **AZ142-020**

| Parameter | Measured Value | Method Reporting Limit | Units | Analysis Method | Date Analyzed |
|---|---|---|---|---|---|
| Benzene | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Toluene | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Ethylbenzene | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Total Xylenes | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Methyl-t-butyl ether (MTBE) | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Diisopropyl ether (DIPE) | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Ethyl-t-butyl ether (ETBE) | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Tert-amyl methyl ether (TAME) | < 0.50 | 0.50 | ug/L | EPA 8260B | 11/22/2005 |
| Tert-Butanol | < 5.0 | 5.0 | ug/L | EPA 8260B | 11/22/2005 |
| TPH as Gasoline | < 50 | 50 | ug/L | EPA 8260B | 11/22/2005 |
| Toluene - d8 (Surr) | 103 | | % | EPA 8260B | 11/22/2005 |
| 4-Bromofluorobenzene (Surr) | 97.4 | | % | EPA 8260B | 11/22/2005 |

| Parameter | Measured Value | Method Reporting Limit | Units | Analysis Method | Date Analyzed |
|---|---|---|---|---|---|

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 47047

Date : 11/29/2005

**QC Report : Matrix Spike/ Matrix Spike Duplicate**

Project Name : **Tesoro Campbell**

Project Number : **AZ142-020**

| Parameter | Spiked Sample | Sample Value | Spike Level | Spike Dup. Level | Spiked Sample Value | Duplicate Spiked Sample Value | Units | Analysis Method | Date Analyzed | Spiked Sample Percent Recov. | Duplicate Spiked Sample Percent Recov. | Relative Percent Diff. | Spiked Sample Percent Recov. Limit | Relative Percent Diff. Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 47022-15 | <0.50 | 40.0 | 40.0 | 43.3 | 42.2 | ug/L | EPA 8260B | 11/22/05 | 108 | 105 | 2.72 | 70-130 | 25 |
| Toluene | 47022-15 | <0.50 | 40.0 | 40.0 | 44.0 | 43.2 | ug/L | EPA 8260B | 11/22/05 | 110 | 108 | 1.90 | 70-130 | 25 |
| Tert-Butanol | 47022-15 | 420 | 200 | 200 | 600 | 588 | ug/L | EPA 8260B | 11/22/05 | 91.6 | 85.2 | 7.20 | 70-130 | 25 |
| Methyl-t-Butyl Ether | 47022-15 | 14 | 40.0 | 40.0 | 48.4 | 47.2 | ug/L | EPA 8260B | 11/22/05 | 84.8 | 81.8 | 3.60 | 70-130 | 25 |

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 47047

**QC Report : Laboratory Control Sample (LCS)**

Date : 11/29/2005

Project Name : **Tesoro Campbell**

Project Number : **AZ142-020**

| Parameter | Spike Level | Units | Analysis Method | Date Analyzed | LCS Percent Recov. | LCS Percent Recov. Limit |
|---|---|---|---|---|---|---|
| Benzene | 40.0 | ug/L | EPA 8260B | 11/22/05 | 106 | 70-130 |
| Toluene | 40.0 | ug/L | EPA 8260B | 11/22/05 | 106 | 70-130 |
| Tert-Butanol | 200 | ug/L | EPA 8260B | 11/22/05 | 98.1 | 70-130 |
| Methyl-t-Butyl Ether | 40.0 | ug/L | EPA 8260B | 11/22/05 | 82.9 | 70-130 |

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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Fax: 530.297.4802

SRG # / Lab No. 47047

Page 1 of 1

# Chain-of-Custody Record and Analysis Request

| | |
|---|---|
| Project Contact (Hardcopy or PDF To): Jeff Kennen | California EDF Report? ☑ Yes ☐ No |
| Company / Address: Azure Env. | Sampling Company Log Code: |
| Phone #: 415-460-1561 Fax #: 460-1569 | Global ID: |
| Project #: AZ142-020 P.O. #: | EDF Deliverable To (Email Address): |
| Project Name: Tesoro Campbell | Sampler Signature: |
| Project Address: 921 E. Hamilton Campbell, Ca. | |

| Sample Designation | Sampling: Date | Sampling: Time | Container: 40 ml VOA | Container: Sleeve | Container: Poly | Container: Glass | Container: Tedlar | Preservative: HCl | Preservative: $HNO_3$ | Preservative: None | Preservative: | Preservative: | Matrix: Water | Matrix: Soil | Matrix: Air | MTBE (EPA 8260B) per EPA 8021 level @ 5.0 ppb | MTBE (EPA 8260B) @ 0.5 ppb | BTEX (EPA 8260B) | TPH Gas (EPA 8260B) | 5 Oxygenates (EPA 8260B) | 7 Oxygenates (EPA 8260B) | Lead Scav.(1,2 DCA & 1,2 EDB-EPA 8260B) | Volatile Halocarbons (EPA 8260B) | Volatile Organics Full List (EPA 8260B) | Volatile Organics (EPA 524.2 Drinking Water) | TPH as Diesel (EPA 8015M) | TPH as Motor Oil (EPA 8015M) | Total Lead (EPA 6010) | W.E.T. Lead (STLC) | | | | TAT | For Lab Use Only |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Analysis Request | | | | | | | | | | | | | | | | | | | ☐ 12 hr ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ 1 wk | |
| MW-1 | 11/6/05 | 1700 | 4 | | | | | X | | | | | X | | | | | X | X | X | | | | | | | | | | | | | | 01 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Relinquished by: | Date | Time | Received by: |
|---|---|---|---|
| [signature] | 11/18/05 | 1200 | |
| Relinquished by: | Date | Time | Received by: |
| | | | |
| Relinquished by: | Date | Time | Received by Laboratory: |
| | 112205 | 1023 | [signature] Kiff Analytical |

Remarks:

Bill to:

For Lab Use Only: Sample Receipt

| Temp °C | Initials | Date | Time | Therm. ID # | Coolant Present |
|---|---|---|---|---|---|
| 13.4 | BAB | 112205 | 1015 | IR-1 | (Yes) / No |

BAB

Distribution: White - Lab; Pink - Originator
Rev: 051805

# APPENDIX B

# FIELD SAMPLING DATA SHEETS

# WATER QUALITY SAMPLING INFORMATION

Date: 11/16/05 Well No: MW-1 Sampled by: DManning / BLWells
Project: Tesoro Campbell, 921 W. Hamilton Ave Project No: AZ-142-020
Sampling method: disposable bailer

**GROUNDWATER**

Well diameter (in.) 2
Well elevation (ft.)
Depth to static water (ft.) 49.00
Water level elevation (ft.)
Well casing depth (ft.) 63.50
Water volume in well (gals)
Pump inlet depth (ft)

**SURFACE WATER**

Stream width (ft.)
Stream depth (ft.)
Stream velocity (cfs.)
Rained Recently (?)

(2-in) Casing=0.16 gals/ft.
4-in. Casing=0.65 gals/ft
6-in Casing=1.47 gals/ft

Sketch of Well Location

Analyses requested: TPHg / BTEX, Fuel Oxys.
No. & types of sample bottles used: 4 Vocs Method of shipment: cooler

| TIME | DEPTH TO WATER (FT.) | VOLUME WITHDRAWN (GALS) | TEMP (deg. F.) | pH | Dissolved Oxygen (O2 mg/l) | CONDUCTIVITY | TURBIDITY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1625 | 49.00 | 0 | | | | | | Start |
| | | 2.5 | 71.3 | 6.61 | 4.5 | 3.97 | High | No odor |
| | | 5.0 | 66.1 | 6.33 | | 3.71 | High | No odor |
| | | 7.5 | 65.0 | 6.27 | | 3.60 | High | No odor |
| | | | | | | | | |
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| | | | | | | | | |
| 1800 | | | | | | | | SAMPLED |

# APPENDIX C
# FIELD METHODS AND PROCEDURES

## Monitoring Well Sampling

Monitoring well MW-1 was sampled on November 16, 2005. During well purging prior to sampling, ground-water parameters (pH, specific conductance, DO and temperature) were monitored and recorded on field logs. Purging continued until parameters stabilize. After purging a minimum of three well volumes, the well was sampled using a new disposable bailer. Ground-water samples were decanted from the bailer into clean, laboratory-provided sample bottles and placed in a chilled cooler for transport to the analytical laboratory under strict chain-of-custody procedures. Water removed from the well during sampling was temporarily stored on-site in a drum and for off-site disposal at an appropriate disposal facility.

## Water-Level Measurement

Water-level measurements were collected from monitoring wells MW-1 through MW-4 on November 16, 2005 to obtain data of ground-water flow direction and gradients at the Site. Depth to water measurements were collected using an electric water-level meter. Ground-water elevations were calculated based on the measured depths to ground water.